

Answers to Multiple Choices from the Web Page

Chapter 1 Answers

1. The _____ is the physical path by which a message travels from sender to receiver. **ans:** c. transmission medium
2. Twisted-pair wire, coaxial cable, and fiber-optic cable are all types of _____. **ans:** c. media
3. A _____ is a set of rules governing data communication between two devices. **ans:** a. protocol
4. A _____ is a set of devices (nodes) connected by media links. **ans:** c. network
5. The _____ is the information (data) to be communicated. **ans:** b. message
6. The message can consist of _____. **ans:** d. any of the above
7. The _____ is the device that sends the message. **ans:** c. sender
8. The source can be a _____. **ans:** d. any of the above
9. The receiver can be a _____. **ans:** d. any of the above
10. Transit time and response time measure the _____ of a network. **ans:** a. performance
11. The number of users on a network has the greatest impact on the network's _____. **ans:** a. performance
12. Network failure is primarily a _____ issue. **ans:** b. reliability
13. _____ is a network reliability issue. **ans:** c. The frequency of failure
14. The time it takes for a network to recover after a failure is a network _____ issue. **ans:** b. reliability
15. _____ is a network reliability issue. **ans:** a. Catastrophe
16. Unauthorized access is a network _____ issue. **ans:** c. security
17. A virus is a network _____ issue. **ans:** c. security
18. Encryption techniques improve a network's _____. **ans:** c. security
19. A _____ is illicitly introduced code that damages a network device. **ans:** b. virus
20. Passwords are used to improve the _____ of a network. **ans:** c. security
21. Unauthorized access and viruses are issues dealing with network _____. **ans:** c. security
22. Which of the following are network reliability issues? **ans:** d. all of the above
23. When a hacker penetrates a network, this is a network _____ issue. **ans:** c. security
24. When a server goes down, this is a network _____ issue. **ans:** b. reliability
25. When an earthquake severs a fiber-optic cable, this is a network _____ issue. **ans:** b. reliability
26. When a network upgrades to a transmission medium with a data rate that is 100 times faster, this improves the _____ of the network. **ans:** a. performance
27. A company doubles the number of nodes on its network. The greatest impact will be on the _____ of the network
ans: a. performance
28. A company changes its network configuration so that only one router instead of two can access the Internet. The greatest impact will be on the _____ of the network. **ans:** c. security
29. A company buys a computer to serve as a backup to its main server. This will mainly affect the _____ of the network.
ans: b. reliability
30. A company requires its users to change passwords every month. This improves the _____ of the network. **ans:** c. security
31. A company requires each employee to power off his computer at the end of the day. This rule was implemented to make the network _____. **ans:** c. more secure
32. The key element of a protocol is _____. **ans:** d. all of the above
33. _____ refers to the structure or format of the data, the order in which they are presented. **ans:** a. Syntax
34. _____ refers to the meaning of each section of bits. **ans:** b. Semantics

35. _____ refers to when data should be sent and how fast the data can be sent. **ans:** c. Timing
36. A protocol that specifies that the receiver address occupy the first byte of the data packet differs in _____ from a protocol that specifies that the receiver address occupy the third byte of the data packet. **ans:** a. syntax
37. Proprietary and nonproprietary standards are both classified as _____ standards. **ans:** a. de facto
38. A _____ standard has been legislated by an officially recognized body. **ans:** b. de jure
39. A _____ standard has not been approved by an organized body but has been adopted as a standard through widespread use. **ans:** a. de facto
40. A _____ standard is one originally invented by a commercial organization as a basis for the operation of its products. **ans:** a. proprietary
41. A _____ standard is one originally developed by a group or committee that has passed it into the public domain. **ans:** b. nonproprietary
42. A _____ standard is often referred to as a closed standard because it closes off communication between systems produced by different vendors. **ans:** a. proprietary
43. A _____ is often referred to as an open standard because it opens communication between systems produced by different vendors. **ans:** b. nonproprietary
44. The ITU-T was formerly known as the _____. **ans:** c. CCITT
45. Telcordia is the name for a company formerly known as _____. **ans:** b. Bellcore
46. The V series and X series are standards developed by _____. **ans:** c. ITU-T
47. Standards for ISDN are developed by _____. **ans:** c. ITU-T
48. IEEE is responsible for a standard for local area networks called _____. **ans:** d. Project 802
49. The _____ is concerned with speeding the growth and evolution of Internet communications. **ans:** d. a and b

Chapter 2 Answers

1. A _____ is a physical communication pathway that transfers data from one device to another. **ans:** c. link
2. A _____ line configuration provides a dedicated link between two devices. **ans:** a. point-to-point
3. A point-to-point line configuration can be _____. **ans:** d. any of the above
4. The link between an infrared remote control and the control system of a television is an example of a _____ line configuration. **ans:** a. point-to-point
5. A _____ line configuration is one in which three or more devices share a single link. **ans:** c. multipoint
6. In a multipoint line configuration, _____ devices share a single link. **ans:** d. three or more
7. In a point-to-point line configuration, _____ devices share a dedicated single link. **ans:** a. exactly two
8. In a _____ line configuration, the capacity of the channel is shared, either spatially or temporally. **ans:** c. multipoint
9. In a multipoint line configuration, if more than one device can use the link simultaneously, we have a _____ shared situation. **ans:** b. spatially
10. In a multipoint line configuration, if the devices take turns using the link, we have a _____ shared situation. **ans:** a. time
11. _____ refers to the way two or more devices attach to a link. **ans:** a. Line configuration
12. _____ refers to the way a network is laid out, either physically or logically. **ans:** b. Topology
13. Which of the following is a basic network topology? **ans:** d. all of the above
14. Which of the following is a basic network topology? **ans:** a. tree
15. Which of the following is a basic network topology? **ans:** c. ring
16. In a _____ relationship, the link is shared equally between devices. **ans:** a. peer-to-peer
17. In a _____ relationship, one device controls traffic and the others must transmit through it. **ans:** c. primary-secondary
18. Devices in a ring or mesh topology are usually configured in a _____ relationship. **ans:** a. peer-to-peer
19. Devices in a star or tree topology are usually configured in a _____ relationship. **ans:** b. primary-secondary
20. The line configuration between devices in a mesh topology is _____. **ans:** a. point-to-point
21. Seven devices are arranged in a mesh topology. _____ physical channels link these devices. **ans:** d. Twenty-one
22. Forty-five physical channels link _____ devices arranged in a mesh topology. **ans:** b. ten
23. When nine devices are arranged in a mesh topology, each device needs _____ input/output ports. **ans:** a. eight
24. When _____ devices are arranged in a mesh topology, each device needs six input/output ports. **ans:** c. seven
25. In a mesh topology with n devices, if a new device is added, _____ new links are needed. **ans:** a. n - 1
26. In a _____ topology, a dedicated link connects a device to a central controller. **ans:** d. star

27. In a _____ topology, a device (non-central controller) needs only one input/output port. **ans:** d. star
 28. A _____ topology is a variation of a star topology. **ans:** d. tree
 29. In a _____ topology, a secondary hub can connect to a central hub. **ans:** d. tree
 30. The central hub in a tree topology contains a _____ to regenerate the received data. **ans:** a. repeater
 31. A secondary hub in a tree topology can be _____. **ans:** d. a or b
 32. A _____ topology has a multipoint line configuration. **ans:** b. bus
 33. A bus topology has a _____ line configuration. **ans:** b. multipoint
 34. In a _____ topology, drop lines and taps are used to connect devices to a backbone. **ans:** b. bus
 35. In a bus topology, a _____ is a link between a device and the backbone. **ans:** a. drop line
 36. Signal reflection at the taps can cause signal degradation in a _____ topology. **ans:** b. bus
 37. In a _____ topology, each device has a dedicated point-to-point connection with exactly two other devices. **ans:** a. ring
 38. In a ring topology, each device has a dedicated point-to-point connection with _____ other device(s). **ans:** c. two
 39. There are n devices arranged in a ring topology. A device is deleted. There are now _____ links of cable. **ans:** a. n
- 1
40. A _____ topology is a combination of several different topologies. **ans:** b. hybrid
 41. In the _____ transmission mode, communication is unidirectional. **ans:** a. simplex
 42. The _____ is an example of a simplex device. **ans:** d. keyboard
 43. In the _____ transmission mode, each station can transmit, but not at the same time. **ans:** b. half-duplex
 44. _____ is an example of a half-duplex system. **ans:** b. CB radio
 45. In the _____ transmission mode, both stations can transmit and receive at the same time. **ans:** c. full-duplex
 46. _____ is an example of a full-duplex system. **ans:** c. The telephone network
 47. _____ refers to the direction of signal flow between two linked devices. **ans:** c. Transmission mode
 48. _____ can determine the category of a network. **ans:** d. all of the above
 49. A _____ is usually privately owned and links the devices in a single office, building, or campus. **ans:** a. LAN

Chapter 4 Answers

1. _____ signal repeats a pattern over and over again. **ans:** c. A periodic
2. _____ signal has no repeating pattern. **ans:** d. An aperiodic
3. The _____ wave is the simplest analog signal. **ans:** a. sine
4. The sine wave is an example of _____ signal. **ans:** a. an analog
5. The amplitude of a signal can be measured in _____. **ans:** d. any of the above
6. On a time-domain plot, the _____ of a signal is the vertical value from a point on the curve to the x-axis. **ans:** a. amplitude
7. If the maximum value of a simple sine wave is 10 volts, the minimum value is _____ volts. **ans:** d. - 10
8. If the maximum value of a simple sine wave is 10 volts, the voltage values _____. **ans:** c. range from -10 to 10, inclusive
9. A simple sine wave completes one cycle in one microsecond. Its frequency is _____. **ans:** a. 1 MHz
10. The period of a signal is usually expressed in _____. **ans:** c. seconds
11. The frequency of a signal is usually expressed in _____. **ans:** a. Hz
12. The _____ of a signal is usually expressed in Hz. **ans:** b. frequency
13. The _____ of a signal is usually expressed in seconds. **ans:** c. period
14. The frequency of a signal is inversely related to its _____. **ans:** b. period
15. The _____ of a signal is its number of cycles per second. **ans:** b. frequency
16. The _____ of a signal is the time it needs to complete one cycle. **ans:** d. period
17. The value of a simple sine wave at time zero is its maximum positive value. The phase shift is therefore _____ degrees. **ans:** b. 90
18. The value of a simple sine wave at time zero is zero. The next value is negative. The phase shift is therefore _____ degrees. **ans:** c. 180
19. The value of a simple sine wave at time zero is zero. The next value is positive. The phase shift is therefore _____ degrees. **ans:** a. 0
20. A nanosecond is _____ as long as a microsecond. **ans:** c. 0.001
21. A picosecond is _____ as long as a nanosecond. **ans:** c. 0.001
22. Ten thousand milliseconds equal _____. **ans:** b. ten seconds
23. One thousand picoseconds equal _____. **ans:** d. one nanosecond
24. A signal with a frequency of 10 MHz has more cycles per second than a signal with a frequency of _____. **ans:** a. 10 KHz
25. A signal with a period of 1 microsecond has a higher frequency than a signal with a period of _____. **ans:** a. one millisecond
26. A signal with a period of 1 microsecond has a lower frequency than a signal with a period of _____. **ans:** d. b or c
27. The equivalent of 20 MHz is _____. **ans:** a. 20×10^6 Hz

28. A signal with a frequency of 1 GHz has more cycles per second than a signal with a frequency of _____. **ans:** c. one MHz
29. A sine wave has a frequency of 10 Hz. Its period is _____. **ans:** c. 0.1 second
30. A sine wave completes one cycle in 20 seconds. Its frequency is _____. **ans:** c. 0.05 Hz
31. A signal has a constant value of 10 volts. Its frequency is _____ Hz. **ans:** a. zero
32. A simple sine wave is offset one half cycle at time zero. This is a phase shift of _____ degrees. **ans:** d. 180
33. A simple sine wave completes one cycle in _____ degrees. **ans:** d. 360
34. A phase shift of 180 degrees is the same as a phase shift of _____ of a cycle. **ans:** c. one half
35. In a time-domain plot, signal amplitude is plotted against _____. **ans:** c. time
36. A time-domain plot shows signal _____ with respect to time. **ans:** a. amplitude
37. In a frequency-domain plot, the signal amplitude of a simple sine wave is plotted against _____. **ans:** c. frequency
38. In a frequency-domain plot of a composite signal consisting of twelve sine waves (all of different frequencies and amplitudes), there are _____ vertical bars. **ans:** c. 12
39. A signal with constant amplitude of ten volts has a frequency of _____. **ans:** a. 0
40. The _____ of a signal is the collection of all its component frequencies. **ans:** b. frequency spectrum
41. The _____ of a signal is the width of its frequency spectrum. **ans:** a. bandwidth
42. A signal is decomposed into two sine waves, one with a frequency of 10 Hz, the other with a frequency of 90 Hz. The bandwidth of the signal is _____ Hz. **ans:** d. 80
43. A signal is decomposed into three sine waves with frequencies of 10, 20, and 30 Hz. The bandwidth of the signal is _____ Hz. **ans:** b. 20
44. The bandwidth of a signal is 10 KHz. The frequency of the sine wave with the highest frequency is 11 KHz. The frequency of the sine wave with the lowest frequency is _____ Hz. **ans:** a. 1
45. The _____ is the time required to send one bit. **ans:** a. bit interval
46. The _____ is the number of bits sent in one second. **ans:** b. bit rate
47. A bit interval of 0.1 seconds means a bit rate of _____ bps. **ans:** c. 10
48. A digital signal has a bit rate of 200 bps. The bit interval is _____ seconds. **ans:** a. 0.005
49. A bit interval of 10 milliseconds means a bit rate of _____ bps. **ans:** d. 100
50. A digital signal has a bit rate of 50 Kbps. The bit interval is _____ microseconds. **ans:** b. 20

Chapter 5 Answers

1. In _____ encoding one amplitude represents a 1 bit and zero amplitude represents a 0 bit (or vice versa). **ans:** a. unipolar
2. In _____ encoding positive and negative amplitudes represent the bits. **ans:** b. polar
3. In _____ encoding positive, negative, and zero amplitudes represent the bits. **ans:** c. bipolar
4. A digital signal has its 0 bits represented by 0 volts and its 1 bit represented by 5 volts. This is _____ encoding. **ans:** a. unipolar
5. A digital signal has its 0 bits represented by 0 volts and its 1 bit represented by -5 volts or 5 volts. This is _____ encoding. **ans:** c. bipolar
6. A digital signal has its 0 bits represented by -5 volts and its 1 bit represented by 5. This is _____ encoding. **ans:** b. polar
7. The DC component is a serious problem for _____ encoding. **ans:** a. unipolar
8. Unipolar encoding has a DC component because the average _____ of the signal is nonzero. **ans:** a. amplitude
9. NRZ-L is a _____ encoding method. **ans:** b. polar
10. NRZ-I is a _____ encoding method. **ans:** b. polar
11. RZ is a _____ encoding method. **ans:** b. polar
12. Manchester encoding is a _____ encoding method. **ans:** b. polar
13. Differential Manchester encoding is a _____ encoding method. **ans:** b. polar
14. AMI is a _____ encoding method. **ans:** c. bipolar
15. B8ZS is a _____ encoding method. **ans:** c. bipolar
16. HDB3 is a _____ encoding method. **ans:** c. bipolar
17. _____ encoding is superior to _____ encoding because the problem of the DC component is alleviated. **ans:** c. Polar; unipolar
18. Ethernet LANs use _____ encoding. **ans:** b. Manchester
19. Token Ring LANs use _____ encoding. **ans:** c. differential Manchester

20. In _____ encoding the transition between a positive and a negative voltage represents a 1 bit. **ans:** a. NRZ-I
21. In _____ encoding halfway through each bit interval, the signal returns to zero. **ans:** c. RZ
22. RZ encoding requires _____ signal change(s) to encode one bit. **ans:** c. two
23. Manchester and differential Manchester encoding are both types of _____ encoding. **ans:** c. biphase
24. Which of the following is not a type of bipolar encoding? **ans:** b. RZ
25. The DC component problem is handled in AMI through _____. **ans:** c. alternate positive and negative amplitudes for the 1 bits
26. The DC component problem is handled in pseudoternary AMI through _____. **ans:** d. alternate positive and negative amplitudes for the 0 bits
27. The synchronization problem for long streams of 1s is handled in AMI through _____. **ans:** c. alternate positive and negative amplitudes for the 1 bits
28. AMI is an acronym for _____. **ans:** b. alternate mark inversion
29. _____ is a variation of AMI. **ans:** d. a and b
30. _____ is an attempt to synchronize long strings of 0s. **ans:** d. a and b
31. In _____ encoding, anytime there are eight or more consecutive 0 bits, violations are deliberately introduced. **ans:** a. B8ZS
32. In _____ encoding, anytime there are four or more consecutive 0 bits, violations are deliberately introduced. **ans:** b. HDB3
33. _____ encoding is used in North America to provide synchronization of strings of 0s. **ans:** a. B8ZS
34. _____ encoding is used in Europe and Japan to provide synchronization of strings of 0s. **ans:** b. HDB3
35. In B8ZS encoding, a string of eight consecutive 0s produces _____. **ans:** b. two violations
36. In HDB3 encoding, a string of four consecutive 0s produces _____. **ans:** a. one violation
37. In _____ conversion we are representing analog information as a series of 0s and 1s. **ans:** b. analog-to-digital
38. In _____, an analog signal is sampled at equal intervals, with the resulting pulses still analog in value. **ans:** c. PAM
39. In _____, the first step after PAM is quantization of the analog pulses. **ans:** d. PCM
40. The _____ sampling rate is based on the Nyquist theorem. **ans:** b. PAM
41. A sampling rate of _____ million samples per second is needed for a signal with components ranging from 10MHz to 100 MHz. **ans:** d. 200
42. The process of changing one of the characteristics of a carrier analog signal based on the information in a digital signal is called _____ conversion. **ans:** c. digital-to-analog
43. In _____ the frequency of the carrier signal is varied based on the information in a digital signal. **ans:** c. FSK
44. In _____ the amplitude of the carrier signal is varied based on the information in a digital signal. **ans:** a. ASK
45. In _____ the phase of the carrier signal is varied based on the information in a digital signal. **ans:** b. PSK
46. In _____ the phase and amplitude of the carrier signal is varied based on the information in a digital signal. **ans:** d. QAM
47. Most modern modems use _____ for digital to analog modulation. **ans:** d. QAM
48. _____ rate is the number of bits per second; _____ rate is the number of signal units per second. **ans:** b. Bit; baud
49. _____ rate is always less than or equal to _____ rate. **ans:** a. Baud; bit
50. If the bit rate is 1200 bps and there are 4 bits for each signal element, then the baud rate is _____. **ans:** d. 300
51. If the baud rate is 1200 and there are 4 bits for each signal element, then the bit rate is _____. **ans:** a. 4800
52. An ASK modulated signal has a bit rate of 2000 bps; the baud rate is _____. **ans:** a. 2000
53. A 2-PSK modulated signal has a bit rate of 2000 bps; the baud rate is _____. **ans:** a. 2000
54. A 4-PSK modulated signal has a bit rate of 2000 bps; the baud rate is _____. **ans:** b. 1000
55. An 8-PSK modulated signal has a baud rate of 2000; the bit rate is _____ bps. **ans:** b. 6000
56. An 8-QAM modulated signal has a baud rate of 2000; the bit rate is _____ bps. **ans:** b. 6000
57. A 32-QAM modulated signal has a baud rate of 2000; the bit rate is _____ bps. **ans:** b. 10000
58. A 128-QAM modulated signal has a baud rate of 2000; there are _____ bits per baud. **ans:** c. 7
59. A 256-QAM modulated signal has a bit rate of 8000; there are _____ bits per baud. **ans:** c. 8

60. OOK is a type of _____ modulation. **ans:** a. ASK
61. The modulation technique most affected by noise is _____. **ans:** a. ASK
62. For _____, the minimum bandwidth required for transmission is equal to the baud rate. **ans:** d. a and b
63. The minimum bandwidth for an ASK modulated signal with a baud rate of 5000 is _____ Hz. **ans:** c. 5000
64. On a 16-QAM-constellation diagram, each constellation point represents a _____. **ans:** c. quadbit
65. In FM the _____ of the information signal modulates the frequency of the carrier signal. **ans:** a. amplitude
66. In AM the _____ of the information signal modulates the amplitude of the carrier signal. **ans:** a. amplitude
67. In PM the _____ of the information signal modulates the phase of the carrier signal. **ans:** a. amplitude
68. In which type of modulation can the bit rate be four times the baud rate? **ans:** c. PSK
69. In which type of modulation can the bit rate be three times the baud rate? **ans:** d. None of the above
70. In which type of modulation can the bit rate be half the baud rate? **ans:** d. None of the above
71. In _____ modulation, the bit rate is 8 times the baud rate. **ans:** c. 256-QAM
72. In _____ modulation, the baud rate is 1/4 times the bit rate. **ans:** d. None of the above
73. In a dibit modulation, the number of points in the constellation is _____. **ans:** b. 4
74. In a tribit modulation, the number of points in the constellation is _____. **ans:** c. 8
75. A 4-PSK constellation is a _____ modulation. **ans:** a. dibit
76. An 8-QAM constellation is a _____ modulation. **ans:** b. tribit
77. The number of points in the constellation of an 8-PSK modulation is _____ the number of points for an 8-QAM. **ans:** c. equal to
78. If the baud rate for modulation scheme A is two times the baud rate for modulation scheme B, the required bandwidth for scheme A is _____ the one for scheme B. **ans:** a. more than
79. If the bit rate for modulation scheme A is two times the bit rate for modulation scheme B, the required bandwidth for scheme A is _____ the one for scheme B. **ans:** d. we cannot tell

Answers to Multiple Choices from the Book

Chapter 1 Multiple Choices:

24. c 25. b 26. b 27. d 28. c 29. b 30. d 31. b 32. c 33. a 34. a 35. d 36. c 37. a 38. a 39. c 40. a 41. b 42. b

Chapter 2 Multiple Choices:

17. b 18. c 19. a 20. a 21. b 22. a 23. a 24. a 25. b 26. c 27. c 28. a 29. d 30. c 31. d 32. b 33. b 34. a

Chapter 4 Multiple Choices:

26. b 27. c 28. a 29. a 30. a 31. b 32. a 33. d 34. d 35. c 36. d 37. b 38. a 39. b 40. d 41. b 42. a 43. c 44. a 45. b

Chapter 5 Multiple Choices:

34. b 35. a 36. d 37. c 38. a 39. b 40. d 41. c 42. d 43. d 44. c 45. d 46. c 47. a 48. b 49. d 50. a 51. c 52. a 53. a 54. d 55. b 56. b 57. b 58. a 59. b 60. c 61. c 62. b 63. d 64. d 65. c 66. b 67. b 68. d 69. d